

CLAIMS

1. An OSD composite image decoding apparatus comprising:

image decoding means of decoding plural types of compressed image data which are different in image resolution format from each other;

first image resolution format conversion means of converting decoded image data decoded by said image decoding means to a first image resolution format and outputting said decoded image data thus converted when said decoded image data has an image resolution format other than said first image resolution format while outputting said decoded image data without conversion when said decoded image data has said first image resolution format;

OSD generating means of generating OSD for said first image resolution format to be synchronously superimposed on the image data outputted from said first image resolution format conversion means;

OSD synthesis means of superimposing said OSD for said first image resolution format generated by said OSD generating means and said image data outputted from said first image resolution format conversion means on each other;

second image resolution format conversion means of converting said image data having said first image resolution

format which has undergone synthesis by said OSD synthesis means to image data having a second image resolution format having a lower resolution than said first image resolution format;

third image resolution format conversion means of converting the image data having said first image resolution format which has undergone synthesis by said OSD synthesis means to image data having a third image resolution format having a lower resolution than said second image resolution format;

plural output terminals to be connected to display devices, respectively;

output switching means connected to said OSD synthesis means, said second image resolution format conversion means and said third image resolution format conversion means and capable of inputting the image data having said first image resolution format, the image data having said second image resolution format and the image data having said third image resolution format and outputting them selectively; and

processing means of instructing said output switching means to output image data that is compatible with an image resolution format which is displayable by respective display devices to be connected to said output terminals to respective relevant one of said output terminals.

2. The OSD composite image decoding apparatus according

to claim 1, further comprising image resolution format setting means of inputting and setting relation between each of said output terminals and an image resolution format which is displayable by said display device to be connected thereto, wherein

said processing means is operative to input said relation by said image resolution format setting means and gives an instruction according to said relation.

3. The OSD composite image decoding apparatus according to claim 1, further comprising image resolution format obtaining means provided between the output switching means and at least one of the plural output terminals and operative to obtain information indicative of the image resolution format of the display device to be connected to that output terminal and outputting the information to the processing means.

4. The OSD composite image decoding apparatus according to claim 1, wherein said processing means is operative to judge a type of image resolution format which is allowed to be outputted based on stream information included in said decoded image data and control said output switching means.

5. The OSD composite image decoding apparatus according to claim 4, wherein:

said compressed image data is compressed image data read out of a DVD;

said stream information includes a digital copy control descriptor; and

said processing means is operative to prohibit an analog output of the image data in said first image resolution format when the image resolution format of the image data is copy-protected by said digital copy control descriptor.

6. The OSD composite image decoding apparatus according to claim 1, wherein when plural ones of said display devices whose image resolution formats are different are connected to respective said output terminals at the same time, said processing means is operative to instruct said output switching means to output image data that is compatible with an image resolution format which is displayable by respective said display devices to be connected to respective said output terminals to respective relevant one of said output terminals.

7. The OSD composite image decoding apparatus according to claim 1, wherein said first image resolution format conversion means is operative to judge the image resolution format of said decoded image data by utilizing at least one of pixel clock frequency, horizontal synchronizing signal frequency and vertical synchronizing frequency of said decoded image data and determine an enlargement ratio to said first image resolution format based on said image resolution format thus judged.

8. The OSD composite image decoding apparatus according

to claim 1, wherein:

said processing means is operative to judge the image resolution format of said decoded image data from stream information included in said decoded image data, determine an enlargement ratio to said first image resolution format based on said image resolution format thus judged, and inform said first image resolution format conversion means of said enlargement ratio thus determined; and

said first image resolution format conversion means is operative to convert said decoded image data to said first image resolution format using said enlargement ratio thus given.

9. The OSD composite image decoding apparatus according to claim 1, wherein:

said first image resolution format is 1080i image resolution format;

said second image resolution format is 480p image resolution format; and

said third image resolution format is 480i image resolution format.

10. An OSD composite image decoding method comprising:
an image decoding step of decoding plural types of compressed image data which are different in image resolution format from each other;

a first image resolution format conversion step of

converting decoded image data decoded at said image decoding step to a first image resolution format and outputting said decoded image data thus converted when said decoded image data has an image resolution format other than said first image resolution format while outputting said decoded image data without conversion when said decoded image data has said first image resolution format;

an OSD generating step of generating OSD for said first image resolution format to be synchronously superimposed on the image data outputted at said first image resolution format conversion step;

an OSD synthesis step of superimposing said OSD for said first image resolution format generated at said OSD generating step and the image data outputted at said first image resolution format conversion step on each other;

a second image resolution format conversion step of converting said image data having said first image resolution format which has undergone synthesis at said OSD synthesis step to image data having a second image resolution format having a lower resolution than said first image resolution format;

a third image resolution format conversion step of converting the image data having said first image resolution format which has undergone synthesis at said OSD synthesis step to image data having a third image resolution format

having a lower resolution than said second image resolution format;

an output switching step capable of inputting the image data having said first image resolution format which results from said OSD synthesis step, the image data having said second image resolution format which results from said second image resolution format conversion step and the image data having said third image resolution format which results from said third image resolution format conversion step and outputting them selectively; and

a processing step of giving an instruction to said output switching step to output image data that is compatible with an image resolution format which is displayable by respective said display devices to be connected to plural output terminals to respective relevant one of said output terminals.

11. A program of causing a computer to function as:

image decoding means of decoding plural types of compressed image data which are different in image resolution format from each other;

first image resolution format conversion means of converting decoded image data decoded by said image decoding means to a first image resolution format and outputting said decoded image data thus converted when said decoded image data has an image resolution format other than said first image

resolution format while outputting said decoded image data without conversion when said decoded image data has said first image resolution format;

OSD generating means of generating OSD for said first image resolution format to be synchronously superimposed on the image data outputted from said first image resolution format conversion means;

OSD synthesis means of superimposing said OSD for said first image resolution format generated by said OSD generating means and said image data outputted from said first image resolution format conversion means on each other;

second image resolution format conversion means of converting said image data having said first image resolution format which has undergone from synthesis by said OSD synthesis means to image data having a second image resolution format having a lower resolution than said first image resolution format;

third image resolution format conversion means of converting the image data having said first image resolution format which has undergone synthesis by said OSD synthesis means to image data having a third image resolution format having a lower resolution than said second image resolution format;

output switching means connected to said OSD synthesis means, said second image resolution format conversion means

and said third image resolution format conversion means and capable of inputting the image data having said first image resolution format, the image data having said second image resolution format and the image data having said third image resolution format and outputting them selectively; and

processing means of instructing said output switching means to output image data that is compatible with an image resolution format which is displayable by respective display devices to be connected to said output terminals to respective relevant one of said output terminals,

of an OSD composite image decoding apparatus as recited in claim 1.

12. A recording medium carrying a program as recited in claim 11, which is operable by a computer.